

***Remarks***

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 9-15 and 17-27 are pending in this application. Claims 7, 8 and 16, which were previously withdrawn from consideration, have been canceled. Claims 9-15 are amended. Claims 17-27 are added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

In the Office Action dated June 11, 2007, the abstract is objected to. Claims 9, 10 and 12-15 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Phelps, U.S. Patent No. 4,857,739 in view of Allemand, et al., U.S. Patent No. 4,461,952. Claim 11 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Phelps and Allemand in view of Weise, U.S. Patent No. 5,469,412.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Claims 10-15 have been amended to improve their readability, and to replace “said” with “the”, in conformance with the more modern style of claim drafting.

***Substitute Specification***

A substitute specification, and a redline showing changes, are submitted, to correct minor informalities and typographical errors, and to conform the specification to current USPTO practice. No new matter has been added.

***Objection to the Abstract***

The abstract has been amended to reduce the number of words to 150. No new matter has been added.

***Rejection of claim 9 under 35 U.S.C. § 103(a)***

All of the claims stand rejected based on Phelps and Allemand, or Phelps and Allemand in combination with Weise. Although Applicant does not necessarily agree with the reasoning expressed in the Office Action, Applicant is amending some of the dependent claims (but not claim 9) to more clearly describe and point out the invention. However, to avoid the next Office Action being a final Office Action (and particularly given the new rules coming into effect on November 1, 2007), claim 9 is not amended, and the rejection is traversed solely on the merits. See MPEP 706.07(a).

***(a) “micro controller”***

Applicant respectfully points out that independent claim 9 recites a **micro controller**. The Office Action argued that Phelps discloses a micro controller. Respectfully, this is incorrect. There is no mention whatsoever of a micro controller in Phelps, which discloses essentially an analog-based system. Reconsideration is therefore respectfully requested based on this patentable distinction between Phelps and the invention of claim 9.

***(b) “a voltage pulse converter ... for transforming a low voltage ... into a constant high voltage”***

Claim 9 also recites “a voltage pulse converter connected between said micro controller and said Geiger-Muller counter for transforming a low voltage from said micro controller into a **constant** high voltage for transmission to said Geiger-Muller counter.” The Office Action

argues that Phelps discloses this feature. Respectfully, this is incorrect. In FIG. 2 of Phelps, the voltage provided to the Geiger counter is not constant – it is interrupted (gated). This has a disadvantage in that the actual peak voltage supplied to the Geiger counter has a swing of about +/- 10%, for most practical implementations. This, in turn, means that the Geiger counter will have swings of +/- 10% in its output. On the other hand, the circuit recited in claim 9 provides a constant high voltage, which improves measurement accuracy and stability.

Reconsideration is therefore respectfully requested based on this additional, separate, ground of patentability.

***(c) “a pulse former connected ... between said Geiger-Muller counter and said micro controller for converting impulses from said Geiger-Muller counter”***

Claim 9 also recites “a pulse former connected to and between said Geiger-Muller counter and said micro controller for converting impulses from said Geiger-Muller counter into predetermined shapes for processing in said micro controller.” The Office Action refers to element 35 in FIG. 1 of Phelps as corresponding to this element. Respectfully, this is incorrect. The diode network 35 of Phelps cannot be connected to a micro controller directly – additional circuitry is required. In any event, the diode network 35 is not connected to a micro controller, which is entirely absent in Phelps, as noted earlier – it is connected between the transformer and the Geiger counter, in Phelps.

Reconsideration is therefore respectfully requested based on this additional, separate, ground of patentability.

*(d) “a time keeping and time indicating unit . . . connected to the micro controller”*

Additionally, claim 9 recites “a time keeping and time indicating unit . . . **connected to the micro controller** for operation thereby.” The Office Action relies on Allemand for disclosure of a radiation detector inside a watch. However, Allemand, which only briefly mentions using watches in a single sentence, at column 7, line 65 – column 8, line 3, does not disclose this aspect. As best can be understood, Allemand simply adds a CZT radiation detector to a watch, but there is no disclosure in Allemand that time keeping functions and radiation detection functions are in any way combined or controlled by a single micro controller.

In any event, there is nothing obvious about using a micro controller to control both the timekeeping element of the device, the radiation detecting element, and the power supply – they can just as easily be entirely separate. The date of the Allemand reference – 1980-1981 – further argues against the notion that the authors of the Allemand reference would have contemplated using a micro controller for controlling both elements. No such micro controller is disclosed in Allemand. This therefore provides an additional, separate patentable distinction over the cited references.

*(e) “calculation of an effective radiation dose”*

Claim 9 also recites “a Geiger-Muller counter in said case for detecting radiation and for delivering corresponding signals to said micro controller for calculation of an effective radiation dose therein.” The Office Action argues that Phelps discloses this aspect. Respectfully, this is incorrect – Phelps is not a measurement device, all it does is “beep” in the presence of radiation. Effective radiation dose is an integrated parameter – radiation dose rate integrated over time. Phelps does not have this function.

Reconsideration is therefore respectfully requested based on this additional, separate, ground of patentability.

***(f) combination of Phelps with Allemand does not result in a practical device***

Furthermore, Applicant respectfully points out that combining Phelps with Allemand, even if theoretically possible, results in a device that is useless as a practical matter. The reason is that the battery on such a device is either too big to fit into a watch, or is so small that the device “dies” in a matter of hours. Such a device is essentially a “paper device” – there is no market for it. It is analogous to a mobile phone that is only good for a single, brief phone call.

It appears to the Applicant that the Office Action views all radiation detectors as essentially interchangeable. Respectfully, this is incorrect. Allemand does not use a Geiger-Muller counter – Allemand specifically contrasts the use of a Geiger-Muller counter to the use of CZT detectors, which Allemand uses instead of a Geiger counter. A CZT detector, being a semiconductor device, can work from a low-voltage supply, and, therefore, Allemand does not face the problem of high voltage needed for Geiger counters, and of power leakage. However, a Geiger counter recited in the claims has advantages over CZT detectors in that (a) it is possible to discriminate based on radiation energy (i.e., based on the wavelength of the radiation), and (b) it consumes no power when no radiation is present.

On the other hand, Allemand does not explain how he would fit a power supply and a high voltage converter needed for a Geiger-Muller counter into a watch case, and make it work in any realistic scenario – for the obvious reason that Allemand is not using a Geiger-Muller counter as a radiation detector. It is therefore accurate to say the references themselves teach against the combination proposed in the Office Action.

*(g) Commercial success of the invention of claim 9*

The Yperwatch, discussed in the background section of the specification and which uses a photodiode radiation detector (and is generally the subject of the Weise patent, of record in this application), is representative of what happens if one were to try to merely combine Phelps with Allemand. To the best of Applicant's knowledge, only a handful of such devices were sold, and the Yperwatch is a commercial failure.

On the other hand, devices that represent various exemplary embodiments of the invention (and, in particular, of claim 9) are manufactured and marketed by Polimaster, see <http://polimaster.us/products/dosimeters/pm1208.php>. Exemplary watch/dosimeters are shown below:<sup>1</sup>



Polimaster, Ltd. (and various affiliated entities that manufacture and market these devices worldwide) are owned by Liudmila Antonauskaya, heir and administrator of estate of Aliaksandr Antanouski, the inventor of the present application. Ludmila Antanovskaya is also the current owner of this application. A Declaration under Rule 1.132 by Ludmila Antanovskaya is submitted regarding commercial success of the invention.

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<sup>1</sup> For the record, Applicant is expressly NOT limiting the claims to the illustrated embodiments, but is merely using these products as illustrative of the claims.

Polimaster expects to sell at least 11,000 such devices this year, which is a clear and dramatic commercial success for a relatively new device. See Declaration of Liudmila Antonauskaya under Rule 1.132. The reason for the commercial success of Polimaster's devices is that the power management problem was solved (see paragraph 0013 of the substitute specification) in the manner claimed in claim 9, and the battery lasts for approximately a year – despite the fact that it uses a Geiger counter, not a semiconductor detector. This is possible precisely because the micro controller manages all the functions of the device, including the claimed pulse converter and pulse former.

Applicant also believes that the numerous distinctions pointed out above are by themselves fully sufficient to demonstrate patentability over any combination of all the cited references, even without the Declaration under Rule 1.132. However, in an effort to present as much evidence as possible at an early stage of the prosecution, the Declaration is submitted as an additional, separate ground of non-obviousness of claim 9.

Reconsideration is therefore respectfully requested based on these patentable distinctions between Phelps/Allemand and the invention of claim 9, as well as based on the commercial success of the devices that represent exemplary embodiments of the invention.

***Rejection of claim 10***

Claim 10, as amended, recites that the first MOSFET switch is connected between the micro controller and the Geiger-Muller counter for measuring radiation intensity in a gating mode in response to a signal from the micro controller. The Office Action argued that Phelps discloses a switch that substantially corresponds to this element. Respectfully, this is incorrect. In Phelps, the switch switches the voltage converter on and off – while claim 10 recites that the

switch is connected to the Geiger counter. This is a fundamental difference, and reconsideration of the rejection of claim 10 is requested based on this additional, separate, ground of patentability.

***Rejection of claim 13***

Claim 13 (both before and after amendments) recites that the “voltage pulse converter includes ... a secondary winding connected to a cathode of the Geiger-Muller counter for applying a reference voltage to the cathode.” The Office Action argued that Phelps discloses this feature. Respectfully, this is incorrect. In Phelps, the cathode of the GM counter is connected directly to ground, see FIG. 2. In the invention of claim 13, the GM counter is supplied with a bias point (reference voltage), to improve measurement stability and accuracy.

***Rejection of claim 14***

Claim 14 (both before and after amendments) recites that a **rectifier having a filter is connected between the secondary winding and the cathode** of the Geiger-Muller counter. The Office Action argued that Phelps discloses this feature. Respectfully, this is incorrect – in Phelps, the cathode is only connected to ground. Reconsideration is respectfully requested.

***New claims 17-27***

New claims 17-27 are added, to provide additional coverage for the present invention. Support for the language of these claims may be found, for example, in originally filed claims, as well as in FIGS. 4-5 of the present application.

Claim 17 is generally modeled on claim 9, however, in order to further clarify the invention, Applicant recited several other elements in claim 17. Support for the language of the claim may be found, for example, in FIG. 4 and associated text in the specification. Specifically,



claim 17 recites a threshold device that includes a bipolar transistor (see element 14 in FIG. 4). In Phelps, the “threshold device” is just a single diode.

Additionally, claim 17 recites a MOSFET switch used to force the Geiger-Muller counter to zero (see element 11 in FIG. 4). This element is absent from Phelps, where the cathode of the Geiger-Muller counter is connected directly to ground.

Additionally, claim 17 recites that the voltage pulse converter is controlled by the micro controller using a MOSFET switch. This aspect is also absent from Phelps (which, as noted earlier, even lacks a micro controller).

Independent claims 18 and 26 recite other combinations of features that are clearly patentable over the cited references, for the reasons discussed earlier.

Applicant also notes that the new claims are directed to measurement of an effective radiation dose rate (measured in Sv/h, or microSv/h, see FIG. 1), or to measurement of an effective radiation dose (measured in Sv, or microSv, see FIG. 1 and claim 27). Effective radiation dose is, of course, the effective radiation dose rate integrated over time.

Thus, for all of the above reasons, Applicant respectfully requests reconsideration and an allowance of the claims.

### ***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action

and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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